

REMARKS

Claims 10-15 are pending in the present application. Claims 1-9 have been canceled. The amendment to claim 10 is supported by paragraph [0025] and Example 1 of the instant specification. New claim 15 is supported by paragraphs [0023] and [0026] of the instant specification. Accordingly, no new matter has been added by these amendments.

Provisional Obviousness-type Double Patenting Rejection

Claim 10 has been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 11 of co-pending application No. 10/549,480. This rejection is respectfully traversed.

A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants are herewith submitting a Terminal Disclaimer disclaiming the terminal portion of any patent granted on the present application which would extend beyond the expiration of any patent which issues from U.S. Application No. 10/549,480. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Issues under 35 USC § 103

Claims 10-14 have been rejected under 35 USC § 103(a) as being obvious over Yamakawa et al. (US Patent App. Pub. No. 2002/0034686) in view of Nissen et al. (US 6,341,057). This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

The present invention

Applicants are claiming an electric double layer capacitor, comprising an electrode and an electrolyte for the electric double layer capacitor. The electrode layer comprises copolymer (A), and an active material for the electrode that is bonded to a current collector. Copolymer (A) comprises:

1. monomer units derived from at least one compound (a) represented by the following general formula (1):



wherein the glass transition temperature obtained by homopolymerizing compound (a) is less than 0°C, and

2. monomer units derived from at least one compound (b) selected from acrylic acid alkyl esters, methacrylic acid alkyl esters, aromatic vinyl compounds, and acrylonitrile, the glass transition temperature obtained by homopolymerizing the compound (b) is 0°C or higher.

The total content of the monomer units derived from the compound (a) and those derived from the compound (b) is 90% or more by weight per 100% by weight of the whole copolymer (A), and the glass transition temperature of the copolymer (A) is 10°C or lower. Additionally, the

electrolyte includes tetraethylammonium tetrafluoroborate, triethylmonomethylammonium tetrafluoroborate, or tetraethylammonium hexafluorophosphate. Thus, Applicants' electric double layer capacitor uses a binder (copolymer (A)) which is appropriate for the specific type of electrolyte recited in claim 10 (i.e. electrolytes which include tetraethylammonium tetrafluoroborate, triethylmonomethylammonium tetrafluoroborate, or tetraethylammonium hexafluorophosphate).

Distinction over Yamakawa '686 in view of Nissen

Yamakawa '686 describes a binder composition which can be used in "a non-aqueous electric double layer capacitor using movement of lithium ion" which means that the capacitor thus described requires the movement of a lithium ion in the capacitor. Applicants have argued that the skilled artisan would not be motivated by the teachings of Yamakawa '686 to use a binder composition suitable for a capacitor which uses the movement of lithium ions with any other type of electrolyte solutions, such as those instantly claimed.

The Examiner was persuaded by these arguments and stated in the Reasons for Allowance dated September 24, 2009 that none of the prior art (including Yamakawa '686) teaches "a double layer capacitor with the binder required for the electrode in conjunction with the electrolyte as recited in claim 1, nor would it have been obvious to modify Yamakawa et al. considering the reference utilizes a different type of electrolyte solution." However, Applicants have since submitted the Nissen reference (US 6,341,057) with the IDS filed concurrently with the RCE on December 18, 2009. In view of the teachings of Nissen, the Examiner argues that although Yamakawa '686 fails to teach Applicants' electrolyte and glass transition temperature

of the binder polymer, it would be obvious to the skilled artisan to use the electrolytes of Nissen in the capacitor of Yamakawa. Nissen describes double layer capacitors comprising current collectors and carbon electrodes with a polymer binder. Nissen further teaches tetraalkylammonium salt electrolyte solutions.

The Examiner notes that Yamakawa '686 discloses "methacrylonitrile" which was within the scope of compound (b) of Applicants' claim 10. However, the teachings of Yamakawa '686 exclude "acrylonitrile" as recited in claim 10, as currently amended. Moreover, Yamakawa '686 *teaches away* from the use of acrylonitrile at paragraph [0008] and in the Comparative Examples therein. In paragraph [0008], Yamakawa '686 describes:

"However, the present inventors found that a secondary battery having an electrode made by using the above-specified copolymer binder exhibits good characteristics at repetition of charge-discharge cycles at room temperature of 20°C to 25°C, but especially when the copolymer binder is used for a positive electrode, the characteristics at repetition of charge-discharge cycles are *drastically reduced* at a high temperature of 60°C or higher, and further that *this is due to the fact that the copolymer binder contains structural units derived from an acrylonitrile monomer.*" (emphasis added)

See also, for example, Comparative Example 1 of Yamakawa '686 wherein the comparative latex being tested differed from the latex of Yamakawa's invention only in the fact that the inventive sample (Example 1) used methacrylonitrile while the comparative sample (Comparative Example 1) used acrylonitrile. Clearly, Yamakawa '686 observed and thereby suggested to the skilled artisan that the use of acrylonitrile in the polymer being claimed would defeat the purpose of the Yamakawa '686 invention. It has been held that "a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)." MPEP 2141.02 VI.

Nissen does not correct this deficiency of Yamakawa '686 since acrylonitriles are not disclosed or suggested therein. Nissen only suggests that the binder may be selected from the group consisting of melamine resins, polyvinyl butyrals and fluoro-containing polymers (see column 5, lines 19-23).

Inasmuch as Yamakawa '686 not only fails to teach acrylonitrile for use in the electrode layer (copolymer (A) of Applicants' claims) but also teaches away from its use therein, and since the combination of Yamakawa '686 with Nissen does not teach the use of acrylonitrile, Applicants assert that the claimed invention is not *prima facie* obvious over the teachings of Yamakawa '686 in view of Nissen. Accordingly, Applicants request that this rejection be withdrawn.

Allowable Subject Matter

Applicants thank the Examiner for indicating possible conditions under which he would find the claims allowable, including the submission of comparative data. Applicants believe the present amendments and arguments serve to distinguish Applicants' invention from the teachings of the prior art.

In view of the above amendments, arguments and Terminal Disclaimer, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Marc S. Weiner, Reg. No. 32,181, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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